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10/767,756	01/28/2004	Masanobu Sato	P/2699-32	5571

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EXAMINER

BLAN, NICOLE R

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

1. The amendment to the claims with the addition of claims 14-19 filed on September 26, 2007 is acknowledged.

Claim Objections

2. Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 1 states a volume median diameter of 5 μm to 40 μm is required, but claim 2 does not further limit claim 1 because it claims a diameter of 10 mm to 16 mm. This broadens the scope of the claim rather than further limiting it. The Examiner believes that it is a typographical error in claim 2 and that the "mm" really should be " μm ". For the purposes of examination, it has been interpreted as 10 μm to 16 μm . Please clarify.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-4 and 14-19 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kanno et al (U.S. 5,918,817).

Kanno teaches a method of treating semiconductor substrate. The method of Kanno comprises generating droplets of a treatment liquid by mixing the treatment liquid with a gas, wherein the size of the droplet particle is about 10 μm ; impinging the droplets on a surface of the substrate. With regard to claims 3 and 4, since Kanno teaches supplying the treatment liquid at a flow rate of about 100 ml/min, which is identical to the flow rate of claim 4, since Kanno teaches the droplet size of about 10 μm , which is within the instantly claimed ranges, the flow rate of the gas for generating such droplets would inherently be within the range as per claim 3.

Furthermore, even if the reference to Kanno is removed from the scope of 35 U.S.C. 102 (b) rejection with regard to claims 3 and 4, one skilled in the art still obviously will come to the gas supply pressure, which corresponds to the gas amount and, therefore, gas flow rate as claimed in order to produce liquid droplets of about 10 μm while supplying a treatment liquid into the cleaning jet nozzle of Kanno at the rate of about 100ml/min.

Claims 18-19: Kanno teaches a substrate treatment method as set forth in claims 1 and 14, respectively, wherein the droplet generating step includes the step of generating the droplets of the treatment liquid by using a bifluid nozzle [(30), Fig. 12, col. 13, line 40] having: a casing [(31 and 32), Fig. 12, col. 13, lines 43-47]; a liquid outlet port for discharging a treatment liquid [(3), Fig. 12, col. 13, line 53]; and a gas outlet port for discharging a gas [space between (32) and (33) as well as space between (34) and above (3), Fig. 12, col. 13, lines 43-53]; whereto the bifluid nozzle is adapted to introduce the treatment liquid and the gas into the casing [col. 13, lines 63-67], generate the droplets of the treatment liquid by spraying the gas discharged from the gas outlet port over the treatment liquid discharged from the liquid outlet port outside the casing, and the spout the droplets on the surface of the substrate [Fig. 12, col. 13, lines 40-67; col. 14, lines 1-33].

7. Claims 1-4 and 14-19 are rejected under 35 U.S.C. 102(a) as being anticipated by Izumi et al (U.S. 2003/0170988).

Izumi teaches a substrate treatment method comprising generating droplets of a treatment liquid by mixing the treatment liquid with compressed air in a bi-fluid nozzle; impinging the droplets on a surface of the substrate, wherein the flow rate of the compressed air introduced into the bi-fluid nozzle is 50 to 100 ml/min, and the flow rate of the treatment liquid introduced into the bi-fluid nozzle is 100 to 150 ml/min. Droplets of the treatment liquid provided Under such conditions each had a diameter of about 5 to about 20 μm (0131).

Claims 18-19: Izumi teaches a substrate treatment method as set forth in claims 1 and 14, respectively, wherein the droplet generating step includes the step of generating the droplets of the treatment liquid by using a bifluid nozzle [(68), Fig. 2, page 2, paragraph 33; page 4,

paragraph 60] having: a casing [(34 and 39), Fig. 2, page 4, paragraph 61]; a liquid outlet port for discharging a treatment liquid [(39a), Fig. 2, page 4, paragraph 62]; and a gas outlet port for discharging a gas [(34a), Fig. 2, page 4, paragraph 62]; whereto the bifluid nozzle is adapted to introduce the treatment liquid [(37c), Fig. 2] and the gas into the casing [(37d), Fig. 2, page 4, paragraph 63], generate the droplets of the treatment liquid by spraying the gas discharged from the gas outlet port over the treatment liquid discharged from the liquid outlet port outside the casing, and the spout the droplets on the surface of the substrate [Fig. 2, pages 4-5, paragraphs 61-65].

Double Patenting

8. Applicant is advised that should claims 1-4 be found allowable, claims 14-17 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

9. Claims 1-4 and 14-17 differ only in the explanation of the term "volume median diameter." The term is defined within the specification and the claims have been examined with respect to the definition of that term; therefore, the claims are substantial duplicates.

Response to Arguments

10. Applicant's arguments filed September 26, 2007 have been fully considered but they are not persuasive.

The Applicant's allege that the Examiner has not interpreted the claims according to the specification. This is not true. The claims have been interpreted in view of the specification.

The definition of volume median diameter requires 50% of the total volume having droplet diameters equal to the claimed diameter. The prior art teaches that each droplet has a diameter equal to the claimed diameter; thus, the volume median diameter of the prior art would be greater than the 50% of the total volume having droplet diameters equal to the claimed diameter. Therefore, the definition of the term was in fact taken into account when examining the instant application.

In response to the Applicants' allegation that neither Kanno nor Izumi teach the droplets having a volume median diameter of 5 μm to 40 μm , the Examiner respectfully disagrees. With respect to Izumi, the Examiner refers the Applicant to the office action dated on June 26, 2006. As pointed to in that office action, Izumi teaches that *each* droplet has a diameter of about 5 μm to about 20 μm [see page 9, paragraph 131]. Therefore, it meets the limitation of the claimed diameter because all of the droplets fall within that range; thus, the liquid droplet diameter accounts for 50% of the total volume of all the observed liquid droplets.

With respect to Kanno, the Examiner draws the Applicants' attention to column 14, lines 17-33. Kanno teaches that in the third embodiment the diameters of the droplets are about 20 μm , about 10 μm , about 5 μm , and about 2 μm . It is apparent that within this embodiment, these are the only size droplets; therefore, it meets the limitation of the claimed diameter because the claimed liquid droplet diameter accounts for 50% of the total volume of all the observed liquid droplets.

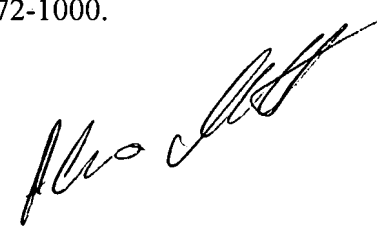
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole Blan whose telephone number is 571-270-1838. The examiner can normally be reached on Monday - Thursday 8-5 and alternating Fridays 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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